CLAIMS

1. A structured packing module comprising:

a plurality of structured packing sheets positioned in an upright, parallel relationship to each other, each structured packing sheet having corrugations formed of alternating peaks and valleys and corrugation sidewalls that extend between adjacent ones of the peaks and valleys, the structured packing sheets being constructed and arranged such that the corrugations of each one of the structured packing sheets extend at an oblique angle to the corrugations of each adjacent one of the structured packing sheets and a specific surface area of the structured packing sheets in the structured packing module is greater than 100 m^2/m^3;

wherein at least some of peaks on a front side of each one of the structured packing sheets is in contact with the at least some of the peaks on a facing back of an adjacent one of the structured packing sheets; and

a plurality of apertures in the structured packing sheets for allowing passage of fluid through the structured packing sheets, the apertures in each one of the structured packing sheets being open to each adjacent one of the structured packing sheets and being substantially unimpeded, the apertures being distributed in each one of the structured packing sheets such that the corrugation sidewalls have a greater density of open areas formed by the apertures than any density of any of the open areas that may be present in the peaks and valleys;

wherein said apertures are distributed to reduce a pressure drop between a top and bottom edge of the structured packing module by their placement such that a greater density of said open areas is present nearer the center lines of said corrugation sidewalls than any density of any open areas that may be present nearer to said peaks and valleys.

2. The structured packing module of claim 1, wherein said apertures are only present in the corrugation sidewalls.

3. The structured packing module of claim 1, wherein in each of said corrugation sidewalls said apertures are arranged in two or more spaced apart rows that extend in a direction parallel to the direction of longitudinal extension of said peaks and valleys.

4. The structured packing module of claim 3, wherein the corrugations of each of said packing sheets have an apex angle in the range of from 70° to 120°.

5. The structured packing module of claim 1, wherein the open area of each of said structured packing sheets is in the range of 8 to 20 percent, based on the total surface area of the associated packing sheet.

6. The structured packing module of claim 1, wherein each of said apertures has a maximum planar dimension in the range of 1 mm to 13 mm.

7. The structured packing module of claim 1, wherein said apertures have a round shape.

8. The structured packing module of claim 1, including spacers on said peaks that contact only some of the peaks on the facing side of an adjacent one of the structured packing sheets.

9. The structured packing module of claim 8, wherein said spacers are formed as sections of said peaks having a smaller apex radius than adjacent depressed sections of said peaks that have a larger apex radius.

10. The structured packing module of claim 9, wherein some of said apertures are positioned at transitions from said depressed sections of said peaks to said sections of said peaks having a smaller apex radius.

11. The structured packing module of claim 1, wherein some of said apertures are positioned in said peaks and valleys.

12. The structured packing module of claim 1, wherein said corrugations have an apex radius in the range of from 1 mm to 15 mm.

13. The structured packing module of claim 1, wherein said apertures are only present in the corrugation sidewalls and said apertures are arranged in two or more rows that extend in a direction parallel to the direction of extension of said peaks and valleys, wherein the open area of each of said packing sheets is in the range of from 11 to 15 percent, based on the total surface area of the associated packing sheet and each of said apertures has a maximum planar dimension in the range of from 2 mm to 8 mm, wherein said corrugations have an apex angle in the range of from 70° to 120° and an apex radius in the range of 1 mm to 15 mm, and wherein at least a portion of the corrugations of adjacent packing sheets are spaced apart from one another.

14. A mass transfer column comprising:

a shell defining an open internal region; and

at least one structured packing module of claim 1 within said open internal region.

15. The mass transfer column of claim 14, wherein said apertures are only present in the corrugation sidewalls.

16. The mass transfer column of claim 14, wherein said apertures are distributed such that a greater density of said open areas is present nearer the center lines of said corrugation sidewalls than any density of any open areas that may be present nearer to said peaks and valleys.

17. The mass transfer column of claim 14, wherein said apertures are arranged in two or more spaced apart rows that extend in a direction parallel to the direction of longitudinal extension of said peaks and valleys.

18. The mass transfer column of claim 14, wherein the open area of each of said structured packing sheets is in the range of 6 to 20 percent, based on the total surface area of the associated packing sheet.

19. The mass transfer column of claim 14, wherein each of said apertures has a maximum planar dimension is in the range of 2.5mm to 6 mm.

20. The mass transfer column of claim 14, wherein said corrugations have an apex angle is in the range of 70° to 120° and an apex radius in the range of 1 mm to 15 mm.

21. The mass transfer column of claim 14, wherein said apertures are only present in the corrugation sidewalls and said apertures are arranged in two or more rows that extend in a direction parallel to the direction of extension of said peaks and valleys, wherein the open area of each of said packing sheets is in the range of from 11 to 15 percent, based on the total surface area of the associated packing sheet and each of said apertures has a maximum planar dimension in the range of from 2 mm to 8 mm, wherein said corrugations have an apex angle in the range of from 70° to 120° and an apex radius in the range of from 2 mm to 8 mm, and wherein at least a portion of the corrugations of adjacent packing sheets are spaced apart from one another.